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November 3, 1951

SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE



For Sandy Plains

See Page 282

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Scientists Solve Another Secret of Transformer Life-Span



Transformer failure is costly—far more than the cost of a new unit. So Westinghouse is constantly seeking ways to lengthen transformer life.

Of three major causes of transformer failure, two are well under control, namely, “burn-outs” resulting from “electrical overloads”, and “lightning strokes”. Now, a new painting system developed by Westinghouse engineers should go a long way toward solving the third problem—the problem of corrosion.

Transformers take a terrific beating from the weather. Boiling sun. Driving rain. Sleet. Snow. Salt-water spray along sea coasts. Acid and alkali exposure . . . all these conditions cut life expectancy sharply.

With the same determined effort that licked “electrical overload” and “lightning stroke” problems, Westinghouse scientists took up the fight against corrosion . . . came up with a three-deck “paint sandwich” that doubles transformer tank life—even where corrosion conditions are most severe.

Key to this improved finish is a middle layer of paint containing mica flakes in a syrup-like plastic

that forms a coating like a shingle roof. First, a special primer is applied that seals the steel from the air. Then the insulating, weather-resisting coat is applied. Over that, a pleasing finish that shuts out ultraviolet light completes the job.

The illustration of the transformer tank at the left shows the effectiveness of the new finish. After 1000 hours of continuous exposure to corrosive salt-water spray, it is still bright and shiny, while the tank at the right, coated with standard finish, fell victim to the salt-water attack. The new finish is expected to provide the same results when exposed under all climatic conditions including sub-zero cold, desert heat and harmful sun rays.

Problems like this are just as important in research at Westinghouse as those which probe the depths of uncharted areas, because our concept of research is not only confined to a quest for the new, but includes an everlasting interest in improving the old as well. Westinghouse Electric Corporation, Pittsburgh, Pennsylvania.

G-10130

YOU CAN BE SURE..IF IT'S Westinghouse

MEDICINE

Ultraviolet May Stop TB

Spread of airborne tuberculosis germs may be halted through use of ultraviolet light. Trial of method in mental hospitals urged.

► ULTRAVIOLET LIGHT, sometimes called man-made sunshine, should be given a trial as a weapon to stop the spread of tuberculosis, in the opinion of Dr. Max B. Lurie, tuberculosis researcher and associate professor at the Henry Phipps Institute of the University of Pennsylvania.

Mental hospitals, where there is a good deal of tuberculosis and where an adequate controlled investigation could be made, would be good places to give it a trial, he points out.

Dr. Lurie's recommendation is based on his studies with rabbits. These showed that a 73% mortality was prevented by ultraviolet irradiation.

In these experiments a manifold or chamber was separated in the middle by a fine wire mesh screen. On one side of the screen was a run for rabbits artificially infected with highly virulent tuberculosis germs. These rabbits shed in their urine tuberculosis germs that were projected into the air by the movement of the animals. The air was in this way contaminated with tuberculosis germs as it is by humans with tuberculosis germs in their sputum.

On the other side of the screen were normal litter mates of highly inbred rabbits.

bits of uniform high and low inherited resistance to tuberculosis. There was no possibility of contact between the tuberculous rabbits and the healthy ones but they all breathed the same air. A wall from floor to ceiling separated the healthy rabbits into two groups. On one side of the wall the air was irradiated with ultraviolet light.

At the end of a year, 11 of 15 rabbits in the room without ultraviolet light were dead. None of 15 in the irradiated room got tuberculosis, though they also breathed air from the TB rabbit room.

The reasoning which led to the rabbit experiments runs like this: Inhaling tuberculosis germs is the most important way in which these germs spread from the sick to the well, in humans as well as rabbits. A single germ, or bacillus, of maximum virulence for the animal under test is enough to cause tuberculosis and death of the animal, if the bacillus gets into a terminal air passage in a lung. No other way of the germ getting into the body, including injection into the blood stream, is fraught with so much danger for the individual.

Only bacilli of a certain diameter can get into the ends of the airways in the

lungs. These bacilli are the invisible isolated ones that float in the air and drop very slowly to the ground. And it is precisely these air-borne isolated bacilli that are most sensitive to ultraviolet light.

Ultraviolet light has been tried a number of times as a method of stopping the spread of various disease germs in the air. The results, Dr. Lurie points out, have been inconclusive. But the diseases in these trials were chiefly ones in which the portal of entry for the germs is not the terminal air passages of the lungs, where only minute particles can penetrate. Instead, these germs are ones whose portal of entry is the upper breathing tract where large-sized germs may lodge.

"It is evident," Dr. Lurie states, "that ultraviolet light may affect but slightly the living germs within large particles temporarily discharged into the air."

"However, it may be very efficient against isolated tubercle bacilli floating in the air, the most potent agent causing pulmonary tuberculosis."

Dr. Lurie's study was aided by grants from the Commonwealth Fund, the National Tuberculosis Association and the U. S. Public Health Service and is reported in the BULLETIN OF THE NATIONAL TUBERCULOSIS ASSOCIATION (Oct.).

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MEDICINE

High Blood Pressure Reduced by Chemicals

► SULFUR-HYDROGEN containing chemicals of a particular make-up, including the anti-war gas chemical BAL, can temporarily reduce high blood pressures in both humans and laboratory animals, Dr. Henry A. Schroeder of Washington University School of Medicine in St. Louis reports to the journal SCIENCE (Oct. 26).

The chemicals are those in which the SH, or sulphydryl, groups occur on the ends of chains of two or three carbon atoms in the chemical molecule. The anti-war gas chemical known as BAL, short for British anti-lewisite, is one such. Others are sodium thioglycolate, beta-mercaptopropionic acid, cysteine, mercaptosuccinic acid and mercaptopyruvic acid.

These chemicals also counteracted the blood-pressure raising effects of such chemicals as adrenalin in laboratory rats.

In humans with high blood pressure, BAL lowered the blood pressure for one and a half to four hours, though this chemical usually raises blood pressure in normal persons. Repeated doses kept the blood pressure down for several days in a few persons. These chemicals do not affect normal blood pressures in either humans or laboratory animals.

"The application of these findings to the control of human hypertension (high blood pressure) deserves further study," Dr. Schroeder states.

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ANGOLA COLOBUS MONKEYS—These rare and lively monkeys of the New York Zoological Society huddled together on a cool, fall morning to provide this study. The long-haired animals come from tropical Africa.

MEDICINE

Better Influenza Vaccine

► BETTER INFLUENZA vaccines seem to be on the way, thanks to work in the World Health Organization laboratories around the world and the World Influenza Center in London during the past two years.

Difficulty with anti-flu vaccines heretofore has been that there are many strains of influenza viruses. Vaccines made to act against one may not be effective if another strain is making people sick.

The classical A strains, used in vaccines made during World War II, have disappeared, in the opinion of Drs. A. Isaacs and C. H. Andrewes of the World Influenza Center. They have been supplanted, these scientists believe, by A prime strains.

Under study right now for its value in a vaccine is an influenza virus strain called P. The P influenza has occurred side by side with one called Q in a number of coun-

tries in different parts of the world. It is believed that they are two phases of 'flu virus and that they are reversible. That is, one may exist in a population for a time, until it has passed through partially immune persons to the point where it encounters so much antibody to it that it is transformed into the other phase. Production of antibodies in the blood in response to influenza virus invasion of the body is, so far as is known, the main defense of human beings against influenza.

In the 1950-51 outbreaks of influenza in Europe, Q strains were associated with mild summer outbreaks while P strains were associated with more severe winter outbreaks.

A "surprising feature" of the 1950-51 outbreaks was the fact that the spread of influenza seemed to be directly geographical rather than along main lines of travel.

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visits may be eight or nine times as frequent. The blood, instead of traveling at a rate of 55 feet a minute in the large arteries, may move 450 feet a minute.

The greater rapidity of the blood flow must therefore make possible a more rapid and complete removal of waste from all parts of the body, and naturally increases the amount of oxygen in certain parts of the body depending on it. Exercise taken simply and regularly tends to keep the arteries soft, warding off arteriosclerosis or other old age conditions.

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PUBLIC HEALTH

Exercise Helps Your Health

► BRISK FALL weather makes many people feel more like getting outdoor exercise, which is a good thing.

Unfortunately, too many give up exercising at the end of the summer and spend most of their time sitting indoors at desk, card table, movies, and riding in cars and buses. Walking is one of the best of exercises, so if you cannot get any other kind, try to walk at least part of the way to work each day.

Exercise alone cannot keep you in good health, but it can help do that. Some of the ways exercise helps are explained by the Illinois State Medical Society as follows:

A chief value of exercise is to stimulate the general chemistry and physiology of the body through its effect on the circulation and on elimination.

This stimulation keeps the action of the muscles smooth and improves the coordination of nerves and muscles. That is particularly true in persons beyond 20 years of age.

In a man at rest about a gallon of blood is circulated every minute. According to one authority, approximately the entire blood supply of the individual visits the tissues once every minute under resting conditions. With vigorous exercise these

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ASTRONOMY

1951 Astronomy Highlights

Ten top achievements include computing positions of five outer planets over 407-year period and finding neutral hydrogen radiation in space.

► **ASTRONOMICAL HIGHLIGHTS** for the past year picked by Dr. Harlow Shapley, director of Harvard College Observatory, Cambridge, Mass., are:

1. Calculation with large digital computing machines of the positions of the five outer planets for the years 1653 to 2060. This was done by Dr. W. J. Eckert of the International Business Machine's Watson Scientific Computing Laboratory, with the assistance of G. M. Clemence of the U. S. Naval Observatory and Dr. Dirk Brouwer of Yale University Observatory.

2. Measurement of velocities up to 3,300 kilometers (about 2,050 miles) per second for hydrogen nuclei (protons) in the aurora borealis. This work by A. B. Meinel of the Yerkes Observatory indicates that protons are the source of much if not all the energy for auroral displays.

3. Raising to over a hundred the number of known "radio stars," detection in the microwave region of radiation from three or four of the brighter spiral galaxies, and progress in the measurement of microwaves from the solar surface. These rapid advances in radio astronomy were made chiefly by radio engineers at Manchester and Cambridge, England; Sydney, Australia, and Leiden, Holland.

4. Putting into operation two special types of Schmidt telescopes: one, the instrument in South Africa owned jointly by Armagh Observatory of North Ireland, Dunsink Observatory of Eire and Harvard Observatory; the other, the first ever designed exclusively for tracking meteors. Both instruments were designed by Dr. James G. Baker and their operation is associated with Harvard Observatory.

5. Theoretical prediction and actual measurement of radiation from neutral hydrogen in the space between the Milky Way stars. Discovery of this invisible hydrogen gas had been predicted by Dr. I. I. Rabi and associates at Columbia University, E. M. Purcell of Harvard University and Dr. H. C. van de Hulst of Leiden Observatory, the Netherlands; Dr. Harold I. Ewen of Harvard University first detected and measured its radiation with a radio telescope.

6. Measurement by Dr. John Hall of the U. S. Naval Observatory of the polarization of light from one and only one of the stars in the Pleiades, an A-type star whose light is highly reddened as it travels from star to observer.

7. Discovery of 216 new variable stars in the so-called Sculptor cluster, wide-open spheroidal galaxy, and prediction that the total number would run over 700. This

finding of Dr. A. D. Thackeray of Radcliffe Observatory, Pretoria, South Africa, is important in verifying the belief that stars making up spheroidal galaxies and globular clusters are much alike.

8. New theory of the ice ages, developed by Dr. Ernst Opik of the Armagh Observatory, North Ireland, attributes both the Paleozoic and Pleistocene glaciations to changes in the radiation of the sun resulting from temporary disturbance in production of atomic energy radiation deep in the sun.

9. Measurement of radial velocities of external galaxies more distant than any heretofore recorded. Dr. Milton Humason, working with spectra only two millimeters long (less than 0.02 of an inch) obtained with the 200-inch Palomar telescope, deduced that some galaxies are rushing away from the solar system at speeds up to 38,000 miles a second, about one-fifth the speed of light.

10. Demonstration that primary cosmic radiation, unlike that with which we are familiar at the earth's surface, is composed of the nuclei of the elements from hydrogen

to iron and beyond, with hydrogen nuclei (protons) dominating. Physicists at the University of Minnesota and Rochester University made the measurements with photographic film carried by balloons to an altitude of 100,000 feet.

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MARINE BIOLOGY

Largest Rock Fished From 3-Mile Pacific Deep

► A NEW deep-sea fishing record has been set by scientists just returned to La Jolla, Calif. Their prize came from the ocean floor, three miles down.

The find—probably the largest rock ever dragged up from a three-mile depth—is now being examined at the University of California's Scripps Institution of Oceanography.

Like many other objects—rocks, whale bones and sharks' teeth—dredged up from the ocean's floor, this 100-pound mass is covered with manganese dioxide. Manganese, a metal used in hardening steel, is known to exist on the bottom of all oceans, and in the dioxide form it coats ocean objects.

By finding out what lies underneath the chemical coating, scientists may get new information on the age of the Pacific, for manganese dioxide does not accumulate on rocks on land.

The prize find was brought up only by chance. Oceanographers on the research vessel *Horizon* had been using a new, more



FISHING FIND—Accidentally dredged up from three-mile deep ocean floor, this manganese concretion is being examined by Jose Barandiaran, Harris B. Stewart, Jr., and John D. Cochrane of the Scripps Institution of Oceanography.

efficient way of telling when their hydrographic wire had reached bottom. The method—breaking a glass ball at the end of the wire, then picking up the sound waves it sets up on the ship's hydrophones—promises to become standard for scientific cruises. One time when it did not work, extra cable was paid out and when this was hauled in, there was the rock, covered with manganese dioxide.

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PHYSICS

Heating of Lead Used To Measure X-Ray Energy

► A "HOT LEAD" technique can now be used to measure X-ray energy in terms of standard heat measurements of energy instead of by indirect measurements through secondary phenomena.

The method, worked out by University of Illinois physicists in Urbana, Ill., measures the rays' heating effects on a block of lead. The method gives very precise measurements and can be used on X-rays of energies from the 400,000 used in conventional medical X-ray treatments, to the 340,000,000 volts from the University's betatron.

Though the physicists term the new method a "hot lead" technique, the actual temperature rise is no more than one-tenth of a degree. The small temperature increases are measured by a thermistor, a new type of heat-measuring device 10 times as sensitive as older resistance thermometers. It is embedded in the lead.

Physicists at the University of Illinois and at the medical campus in Chicago worked together on the new development. P. D. Edwards in the betatron laboratory worked in the 300,000,000-volt range, and J. S. Laughlin at the College of Medicine at the 25,000,000 and 400,000-volt levels.

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ENGINEERING

Find Cure for Dancing Conductors—on Wires

► A CURE for "dancing conductors" was reported in Cleveland. Dancing conductors are not related to band or orchestra leaders. They are transmission lines for electricity, such as those seen along a highway, that have been set in a rhythmic rise-and-fall motion by the wind. This can happen when they are covered with a light glaze of ice. When one wire swings up even with or quite close to another wire, the current jumps across, causing a short circuit.

Dancing conductors can be cured by mechanical dampers and other means, J. E. Sproule and F. L. Code of the Hydro Electric Power Commission of Ontario reported to the American Institute of Electrical Engineers in Cleveland.

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DENTISTRY

Fight Tooth Decay

Very few of nation's public water supplies are being treated with the tiny amount of fluorine that could keep youngsters' teeth more free from decay.

► ONLY ABOUT three-quarters of one percent of America's public water supplies are now adding the tiny amount of fluorine that promises to make the coming generation's teeth more nearly free from decay.

But the dentists, water works engineers and public health experts who are urging fluoridation of water we drink are not discouraged by this fact that only 120 out of the more than 15,000 public water supplies of the nation are fluoridated.

The one big hope of preventing dental caries—decayed teeth in simple words—is treating growing teeth with amounts of fluorine so small that they produce no other effect on human health. This is the biggest dental discovery in recent years, in the opinion of many experts. It produces about a two-thirds reduction in the dental decay rate of children. Too much fluorine occurring naturally in drinking water causes unsightly mottled enamel of teeth. Surprisingly, mottled teeth were more free from decay than prettier teeth. It was found that adding the chemical to teeth, in drinking water or by swabbing it on in the dentist's office, protected teeth from decay in later years.

The U. S. Public Health Service and several other investigators developed the methods. Guinea pig cities, one with fluorine added to its water matched with another left alone, proved that children's teeth could be protected. The rush began to add fluorine to water so children could drink away future toothaches.

Wisconsin is the most fluoridated state. Sixty out of the 120 treated water supplies are in that state.

But the fluorine rush for better teeth is on. Almost every state's health department is helping communities prepare for fluoridating their water, much as a number of years ago chlorination was introduced to clean up polluted water supplies that were spreading water-borne diseases.

Civic clubs, women's organizations and newspapers in various localities, as well as dental and health associations, are campaigning for fluoridation of water supplies so that children can literally drink away their future toothaches.

So difficulties arise in the program:

As often happens with new methods, some misinformed individuals are contending that addition of the minute amounts of fluorine to water is dangerous. There is no good evidence to support such ideas.

State and local health departments, and water works, are limited by facilities and personnel in the speed with which the

fluoridation program can be put into operation. One typical state can extend the method to only one city each month. There is also a limit to the amount of the necessary chemicals that can be produced industrially in the forthcoming months. Money is also necessary to operate the program and install the method, although this amounts to only a few cents each year for each person benefited. Federal funds to aid states have been limited severely by Congress.

Not all the population can be reached with the fluorine chemicals in public water supplies. The millions in very small towns and in rural areas, who drink spring and well water, will need to have their children go to dentists to have the chemicals swabbed on their teeth by a process called topical fluoride applications.

There are a few favored areas where there is enough fluorine naturally in the water to protect future teeth, but there are less than 1,500 of these cities with natural fluoridation. Some areas of excess fluorine content in their water may actually have to remove some of it to prevent mottled enamel.

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ASTRONOMY

Our Milky Way Galaxy Is a Giant Starry Universe

► OUR MILKY WAY galaxy of millions of stars is a giant among the starry universes, Dr. Thornton Page of Yerkes Observatory has just reported to the Smithsonian Institution.

The galaxy of which our solar system forms a tiny part weighs about as much as 200 billion suns, Dr. Page estimates. The Andromeda nebula, nearest object in space beyond the Milky Way galaxy, appears to weigh as much as 100 billion suns. But other nebulae sufficiently close to be seen with the world's largest telescopes weigh only as much as one to ten billion suns, the Yerkes astronomer calculates.

About half the weight of each "island universe" is believed due to the gases and cosmic dust between the stars rather than to the stars themselves.

Latest sampling counts indicate that about 2,000 such starry universes of different shapes and sizes are near enough to our solar system for their light, traveling 186,000 miles a second, to reach us within 13,000,000 years. There are approximately 9,000,000 such stellar universes near enough

for their light to have started on its way to us not more than 200,000,000 years ago. As many as 70,000,000 starry universes exist within 450,000,000 light years of us.

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METEOROLOGY

Forecast Severe Winter with Prompt Spring Following

► A RATHER severe winter will be followed by a fairly prompt spring about mid-March for the eastern half of the nation. With this pattern, it usually works out that the Southwest has an "open" winter and the Pacific Northwest an average winter.

This is the prediction for the 1951-1952 winter by Dr. H. C. Willett, professor of meteorology at the Massachusetts Institute of Technology, Cambridge, Mass.

Dr. Willett told SCIENCE SERVICE that the cold in the Northeast will be severe from mid-November through December. January will be relatively mild, while February will be cold again. Along about mid-March, he said, there will be a definite change in the weather and spring will be upon us.

Through the mid-Atlantic states and the Southeast, the pattern will be the same, although, of course, not quite as cold.

Snow will follow the weather. Heavy snows, Dr. Willett predicts, will hit the Northeast soon after mid-November, the middle Atlantic states a little bit later, and continue to the end of December. January will be relatively free of snow, but it will be back for February. Snow will be heavier in the mid-Atlantic states than farther north, Dr. Willett said.

Dr. Willett, known for his work in extended forecasting, has more courage than the Weather Bureau's Extended Forecast Section. Jerome Namias, head of that section, refuses to predict the weather for any period longer than a month ahead.

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TECHNOLOGY

Combat Footwear Keeps Toes Warm at 45 Below

► U. S. MARINES and Army troops in Korea this winter will be wearing new insulated rubber boots that operate on the Thermos bottle principle and protect against frostbite even at 45 below zero.

Developed by the Hood Rubber Company, Watertown, Mass., and the Naval Clothing Depot, Brooklyn, N. Y., they will replace the shoe-pac in time to prevent a repetition of last winter's cases of frostbite.

The new boot consists of two layers of rubber with two plies of knitted wool insulation between them. It is designed to be worn with just one pair of socks. The innermost layer of rubber is faced with nylon film to help prevent friction on the inside of the boot.

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MEDICINE

Adverse Krebiozen Report

► AN AMERICAN Medical Association committee has reported that trial of Krebiozen, announced last March as a promising remedy for cancer, "fails to confirm the beneficial effects" claimed for it. (J.A.M.A., Oct. 27.)

Of 100 patients given this drug, 44 have died. Only two showed temporary signs of improvement. In one of these it is considered that a period of temporary improvement, such as the patient had been having off and on, happened to come at the time Krebiozen was being given. The patient has since died. In the other patient, now near death, the main cancers continued to grow rapidly, though some small ones showed regression.

Krebiozen is described as a white powder which dissolves in water. It is said to be extracted from the blood serum of a horse after the horse has been inoculated with a substance said to stimulate its reticuloendothelial system, which includes the spleen and lymph glands and certain cells of the bone marrow and liver.

The drug was allegedly discovered by Dr. Stevan Durovic, former Yugoslavian

physician now living in a Chicago suburb with his brother, Marko. Dr. Durovic came to this country from Argentina. A preliminary announcement of trials of the drug was made to a group of doctors and researchers in Chicago last March by Dr. A. C. Ivy, vice-president in charge of the professional schools of the University of Illinois.

The A. M. A. committee still classes Krebiozen as a "secret remedy," because not enough details of its composition and preparation have been given. Investigation of the drug was made as a public service to physicians and the public.

The 100 patients whose clinical histories were reviewed had been given the drug by physicians who had been invited to evaluate the drug by Dr. Ivy and his associates of the Krebiozen Research Foundation. Reports on these 100 patients came from seven sources in four widely separated parts of the country, including the tumor clinic, department of surgery, University of Illinois.

"The public may wonder," the committee points out, "at the wide divergence of opinion between the original report and these published results (in the 100 patients)."

The cancer specialist, it is explained, knows that certain types of cancer often run a long course with marked changes in the patient's condition. The public, not knowing this, may be surprised by unexpected improvement in the patient and if it coincides with some new treatment, thinks the treatment is proving the hoped-for cure.

Relief of pain, improvement in appetite, ability to be up out of bed and speech are all affected by the patient's feeling about the new treatment, but are "notoriously unreliable" as signs of improvement due to treatment.

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BIOCHEMISTRY

Mold Chemical Treats Disfiguring Tropical Ills

► FOR THE war against yaws and tropical ulcer, two of man's oldest and most disfiguring diseases, doctors now have a new weapon in the mold chemical, chloromycetin.

Good results with this chemical, which is also made synthetically, were obtained in trials in Haiti by Dr. Eugene H. Payne of Parke, Davis and Company, Detroit, which supplied the drug. Cooperating with Dr. Payne in the trials in Haiti were Dr. Athemas Bellerive of the Haiti Department of Health and Dr. LaFont Jean of Fort Liberty, Haiti.

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"THERMOS" BOOTS — Two Korean veterans, 1st Lt. Joseph R. Owen, USMC, of Syracuse, N. Y., and S/Sgt. Thomas Davies, Jr., of Dover, N. J., inspect a new insulated rubber boot now being issued in Korea. The boot operates on the same principle as a Thermos bottle and will protect feet against frostbite even at 45 below zero Fahrenheit.

GEOLOGY

**Changes in Crystal Rocks
Linked to Earth's Magnetism**

► A LINK between the changes that occur in rocks of the earth's crust and puzzling variations in the magnetic field of the earth in some regions is suggested by Dr. John D. Weaver, of Columbia University's department of geology in New York in a communication to the journal *SCIENCE* (Oct. 26).

A clue to the reason for the mysterious relationship arose from German war experiments in the making of synthetic mica. Growth of large mica sheets was facilitated in these experiments by a weak magnetic field imposed across the crucible in which the mica materials were being melted. Earlier Japanese work suggested a direct relationship between earthquakes, volcanic eruptions and magnetic anomalies.

Changes in the minerals and their orientation in the rocks under the growing process in the earth's crust, which the geologists know as metamorphism, may be linked with unusual magnetic effects.

Dr. Weaver suggests laboratory experiments on the effect of magnetic and electrostatic fields on crystallizing minerals, together with field studies of magnetic phenomena in areas like the West Indies where the crust is geologically active.

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GENETICS

**Twins Show Genetic
Factor in Polio**

► SEARCH FOR the reasons why one child is more susceptible to polio than another should take into account the factor of inheritance.

This is apparent from a study of twins who had polio. The study, aided by a grant from the National Foundation for Infantile Paralysis, is reported by Drs. C. Nash Herndon and Royal G. Jennings of Bowman Gray School of Medicine of Wake Forest College, Winston-Salem, N. C., in the *AMERICAN JOURNAL OF HUMAN GENETICS* (March).

Twins, they find, are neither more nor less likely to get polio than single born individuals. But both twins of an identical, or one-egg, pair are more likely to get the disease than both twins that are not identical. Of 14 identical twin groups, paralytic poliomyelitis affecting both twins occurred in five pairs. Of 33 non-identical twin groups, paralytic involvement of both twins occurred in only two instances.

This points to the existence of a measurable genetic, or inherited, influence on susceptibility to paralytic polio. None of the 87 parents of the twins had had polio, so the gene carrying the polio susceptibility trait is probably not a dominant. Persons who carry the gene and can hand it down

to their children must be quite numerous, however, since paralytic poliomyelitis is not a rare disease.

Inherited susceptibility is by no means the deciding factor in determining whether a person will get infantile paralysis when exposed to it, the scientists point out. This is shown by their finding that even among identical twins with identical genetic endowment living in the same household, paralysis involving both members of twin groups occurred in only 35.7% of the pairs.

Science News Letter, November 3, 1951

OPTICS

**Plane Spotting Aided by
Twilight Sky Brightness Study**

► AID IN spotting airplanes and other objects in the twilight sky will come from experiments by Naval Research Laboratory physicists reported to the Optical Society of America meeting in Chicago.

The scientists used a special photoelectric tube to measure, in a very short time, the brightness of the whole sky during the twilight period. They found that, higher than ten degrees above the horizon, the twilight sky at Sacramento Peak, New Mexico, was only about half as bright as the twilight sky of Maryland.

Combined with knowledge of how the eye works, the figures they reported will aid in estimating how far away an airplane in the sky can be seen. Their research will also help scientists learn how sunlight behaves when it passes through our atmosphere, since the pressure and density of the upper atmosphere can be calculated from the brightness of the twilight sky.

Dr. E. O. Hulburt, Dr. D. M. Packer, M. J. Koomen, C. Lock and R. Scolnik of the Naval Research Laboratory presented the report.

Science News Letter, November 3, 1951

GENERAL SCIENCE

**Contraceptive Advice
For Unmarried Discussed**

► AT LEAST one doctor in the country recognizes that unmarried people need contraceptive advice.

Speaking at the New York Academy of Sciences conference on world population problems and birth control, Dr. Alan F. Guttmacher of Sinai Hospital and the Johns Hopkins School of Medicine, Baltimore, said he was "unwilling to accept the ostrich-like moralistic viewpoint that such a problem does not exist."

He said he could not give the proper answer to the question whether the youth of the country should be scientifically advised and instructed in birth control. He thinks the proper answer must depend on more "Kinsey-like studies" but that "knowledge must replace taboo and prejudice."

Science News Letter, November 3, 1951

IN SCIENCE

BIOPHYSICS

**Dentist's Drill Makes
Radio Music Sound Sour**

► IF RADIO music in your dentist's office sounds sour when he is drilling a tooth, nothing is wrong with your hearing.

It should sound different. The reason: You are hearing the dentist's drill at the same time. Changes in pitch occur in some pure tones when other tones or noises simultaneously reach the ear, T. V. Frazier of the University of Nevada, Reno, told the Acoustical Society of America meeting in Chicago.

"When a dentist drills on your teeth, the sound of the drilling reaches your ears chiefly by bone conduction," Mr. Frazier said. "The radio sounds, heard by air conduction, are slightly altered every time he turns on his drill."

Experiments carried out in the nearly sound-proof laboratory of the University of California at Los Angeles, where Mr. Frazier did some of his work, show that the effect would be the same if the radio music were heard by bone conduction when the dentist drilled.

Science News Letter, November 3, 1951

PSYCHOLOGY

**Mice Trained for Peace
Give Hope for Mankind**

► HOPE THAT some day humans may be able to live at peace with each other comes from studies showing that mice can be trained "to fight, run away or be peaceful."

The studies were conducted by Drs. J. P. Scott and Emil Fredericson of the Jackson Memorial Laboratory in Bar Harbor, Me.

The scientists point out that men are not mice and what applies to the mice and rats may not apply to humans. But for the mice and rats, training "includes by far the most important group of factors" affecting the consistency with which these animals will fight for gain.

The same laws of learning and habit formation apply to all animals with a backbone, so the scientists hope that other species besides mice could be trained for peace.

Against this hope is the fact that mice, unlike dogs, baboons and people, never "gang up" on one individual. This is apparently a hereditary difference.

Details of the studies are reported to fellow scientists in *PHYSIOLOGICAL ZOOLOGY* (Oct.).

Science News Letter, November 3, 1951

ENE FIELDS

MEDICINE

Blood Chemical Promises New Heart Stimulant

➤ A BLOOD chemical that may turn out to be a heart stimulant has been discovered more or less accidentally by Dr. K. Laki, visiting scientist at the U. S. National Institute of Arthritis and Metabolic Diseases in Washington.

The accidental part of the discovery is that it was made in researches on the clotting mechanism of the blood. Previous research had suggested that when thrombin in the blood acts on another blood chemical, fibrinogen, to make it clot, the thrombin action may split a chemical bond in the fibrinogen molecule and free a small chemical molecule from the fibrinogen. This would leave a slightly altered fibrinogen molecule, presumably the one that becomes a gel and makes the blood clot when shed.

Proof of such a mechanism would rest on finding the small molecule split from the fibrinogen. By a method reported in the journal *SCIENCE* (Oct. 26), Dr. Laki has obtained this small molecule. Tests with it showed it could stimulate a frog heart.

Further studies to determine its chemical nature and to learn whether this blood chemical is a heart stimulant that could be used medically are now in progress.

Science News Letter, November 3, 1951

METEOROLOGY

Change Tropical Weather by Salt-Seeding Trade Winds

➤ PROFOUND CHANGES in the weather in tropical island areas could be brought about by seeding trade winds with salt crystals, Nobel prize winner Dr. Irving Langmuir claimed.

He made the claim at a meeting of the New York Academy of Sciences during which he engaged in debate on rainmaking with Ferguson Hall of the U. S. Weather Bureau. Dr. Langmuir, father of rainmaking, said that near the islands of Hawaii and Puerto Rico, it should frequently be possible to introduce into the trade winds crystals of silver iodide at the rate of one ton per hour.

If heavy rain is induced, he said, the heat generated in the process should cause profound changes in the airflow and the climatic conditions in neighboring areas.

Dr. Langmuir devoted most of his speech to supporting a claim previously made that seeding with silver iodide particles every seven days in New Mexico produced heavier

rain and other weather changes every seven days over almost half the U. S.

He produced figures which he said showed that this seven-day periodicity was statistically significant. These periodicities in rainfall are evident, he said, at almost any set of stations in the northeastern U. S.

Mr. Hall reported on a Weather Bureau project which is investigating the periodicities Dr. Langmuir claims have existed. The investigation, still going on, showed, he said, that similar periodicities existed in the weather at various times during the past 40 years, sometimes long before cloud-seeding was initiated.

The Weather Bureau scientist showed charts which, he said, indicated that a seven-day periodicity existed both before and after the time during which seeding at seven-day intervals was done and that it existed, sometimes to a greater degree, in other parts of the northern hemisphere.

Mr. Hall concluded that the Weather Bureau believes that the effects of cloud-seeding must be quite modest, since it is so difficult to detect them. Asking for further study of natural rain processes, he said that whether cloud-seeding can be of economic value depends on such study.

Science News Letter, November 3, 1951

ACOUSTICS

Jet Engines Quietled By Box of Turns

➤ THE EAR-SHATTERING noise coming from airplane jet engines under test can be made quieter, Dr. Howard C. Hardy, of the Armour Research Foundation of Chicago, reported to the Acoustical Society of America at Chicago.

Instead of permitting the sound from jet engines to "run wild," a special structure channels it through a series of 180-degree turns. Each turn actually "kills" at least 15 decibels of the noise.

"The magnitude of the problem is much larger than in the past war," he declared, "chiefly because the noise of the jet engine is about 10 times as loud and can be heard about 30 times as far as the noise coming from conventional reciprocating gasoline engines."

Science News Letter, November 3, 1951

NUTRITION

How to Freeze Food Told in Government Bulletin

➤ HANDY GUIDE for homemakers who want to freeze their own fruits and vegetables is the new bulletin just issued by the U. S. Department of Agriculture.

Preparation methods given in the pamphlet are based on up-to-date research data. Instructions for packaging a large assortment of foods, from apples to watermelons, are included in "Home Freezing of Fruits and Vegetables." (See p. 286.)

Science News Letter, November 3, 1951

ICHTHYOLOGY

First Silver Salmon Return To Artificial Spawning Spot

➤ THE FIRST silver salmon ever to return to artificial spawning grounds have started coming back to the University of Washington fish pond.

The silver salmon's strong homing instinct leads the adult—either by scent or by other means—back to its hatching pond to spawn. Now that homing instinct is being used to get the fish back to a desired location.

In the spring of 1950 about 26,000 silver salmon fingerlings, then 18 months old, were released from concrete tanks on the university campus in Seattle. These fish climbed down the fish ladder to Lake Union, through government locks to Puget Sound and then to the Pacific Ocean. Now some of them, identified by a clipped ventral fin, are returning via the same route, reversed.

The success of this experiment, originated and supervised by Dr. Lauren R. Donaldson, director of the university's Applied Fisheries Laboratory, opens up new fields in practical hatchery management and controlled fish research. A fish farm, for instance, could be established close to salt water in order to eliminate hazardous runs to and from the upper reaches of spawning streams.

Science News Letter, November 3, 1951

ENGINEERING

Young Engineers Urged To Continue Preparation

➤ "POST-COLLEGE SLUMP" in the development of just-graduated young engineers is being combatted by a six-point program designed by the Engineers' Council for Professional Development, a conference of seven engineering societies representing 130,000 engineers.

The program calls for guidance to the young engineer for an adequate development plan for in-service training, continued college education, community service, professional registration, self-appraisal and selected reading.

Chairman Harry S. Rogers, president of Polytechnic Institute of Brooklyn, said the council's program was a service program to the juniors of the engineering profession. In this respect it must command a self-sacrificing interest from mature professional people.

The "post-college slump," Dean Emeritus H. P. Hammond of Pennsylvania State College said, is the period when the young graduate in his first job no longer has the compulsion toward mental development because of the difficulty of making adjustments to conditions of employment. He advocated part-time postgraduate study and development of professional consciousness.

Science News Letter, November 3, 1951

AGRICULTURE

New Foods From Abroad

Uncle Sam's plant explorers and agricultural chemists team to make earth yield more food with less labor, discovering new plants for food and industry.

By JANE STAFFORD

► A BONANZA harvest of new, better plants for food and industry will be reaped during the second 50 years of Uncle Sam's plant hunters and breeders.

More than 32 billion dollars worth of food and non-food products for industry is coming from American farms this year, not counting the 2 or 3 billion dollars worth of food that stays on the farm to feed farm families and the additional billions in grain kept on the farms to feed livestock there.

Many of these billions in bread and butter, meat and potatoes, onions for the steak, rubber and oil are the golden anniversary gift to the American people from their Department of Agriculture's Bureau of Plant Industry, Soils and Agricultural Engineering, which is just 50 years old. And yet Dr. Robert M. Salter, chief of the bureau, states:

"The big harvest is still ahead."

Plant hunters of the bureau who range the world, sometimes at risk of life, have played a key part in doubling the return from American farms during the past 50 years.

Our Major Crops Not Native

All the major crops grown in this country are of foreign origin. Corn and tobacco were brought here by the Indians from South America. Pioneer settlers from Europe brought in our hay and cereal crops.

Soybeans, one of the most versatile crops grown on American farms, were known in the United States more than 100 years ago. But American farmers did not "strike it rich" with this crop until Uncle Sam's plant hunter, W. J. Morse, in the late 1920's, searched the Orient for breeding material for the improved varieties now grown on more than 14 million acres in the United States. Soybeans now provide raw materials for more than 400 manufactured products including edible oils, industrial oil, paints, varnishes, adhesives, soaps, plastics, vegetable fiber, printing ink and hundreds of others.

The soybean crop is but one example of how Uncle Sam's plant hunters and breeders have in the past 50 years made it possible for our farmers to get more from their land and their labor.

During the past half century, reports Dr. Salter, all crop plants have been made better and some new ones have been introduced. Thousands of improved varieties

have been developed that thrive better under specific soil, climatic and other growing conditions. Shown on the cover of this week's SCIENCE NEWS LETTER is a close-up of an improved strain of Western wheatgrass developed for sand tolerance.

On most farms the variety of each crop grown has been changed several times during the last half century. About 200,000 new plant varieties have been introduced through Uncle Sam's organized program of plant hunting. Notable among these have been:

Ladino clover from Italy, Tung nuts from China, Trebi barley from Asiatic Turkey, Acala cotton from Mexico, dates from Africa, Hegari sorghum from Africa, Ladak alfalfa from India, Federation wheat from Australia, Korean lespedeza, Sericea lespedeza, Abaca from the Philippines, Victoria oats from Uruguay, Russian wild rye from Siberia.

To the city dweller many of these strange names mean little or nothing. But ladino,

lespedeza and some of the other forage crops can be transformed via livestock to more meat and milk and butter. And since crippled, arthritic joints hurt just as much in the city as on the farm, both town and country folk watch eagerly for results of one party of plant hunters now in Mexico looking specifically for plants that might yield cortisone, the drug that relieves suffering from arthritis.

Plant "blood banks" are one of Uncle Sam's operations for improvement of our farm yields. At these banks, germ plasm of plants discovered by the hunters is catalogued, retained, propagated and made available to plant breeders.

Of the thousands of new plant introductions in the past few years, some are already showing signs of future value. From the Midwest there are reports that an alfalfa introduction from Turkey has outstanding resistance to the leaf hopper insect. From Florida there are reports that certain of the introductions of rye, obtained from the high Himalayan area of India, are far better than any other strains so far observed for winter pasture and forage. One of the wild potatoes picked up exploring Mexico has shown high resistance to the Colorado potato beetle.



NEW CROPS—For the big harvest to come, thank U. S. plant hunters and breeders, such as Dr. Edward E. Clayton, who explore the world for new varieties and cross them with others for better yields in bread, oil, rubber and medicines. These future crops, developed by the U. S. Department of Agriculture, are not yet commercially available.



BREEDING STUDIES — Close-up view shows flower of a selected strain of Bermuda grass being emasculated for breeding studies at the Georgia Coastal Plains Experiment Station in Tifton.

In California one cantaloup introduced from India appears resistant to a new strain of Downy Mildew that has attacked the cantaloup industry in that state. From New York we have reports that beans introduced from Turkey show resistance to bean anthracnose, a disease that so far we have had little success in combating. In North Carolina plant breeders have recently found nematode resistance in lespedeza. The recently introduced Roan variety is the first lespedeza with nematode resistance. The source for that resistance was an introduction from the Orient.

Castor beans look like a possible crop for replacing cotton on some lands in Oklahoma, western Arkansas, and northern Texas. Castor beans are a source of oil for many industrial uses. Research is under way on breeding and selecting high-yielding, shatter-resistant varieties adapted to mechanical harvesting. About 90,000 acres are being grown this year.

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Safflower is a promising new oil crop adapted to the wheat areas of the Western Plains. Safflower seed yields are of very high quality for cooking or for paints and varnishes and meal of high protein content for livestock feed. Seed of high-oil-content varieties was available for planting about 150,000 acres last year.

Sesame is under study as a possible vegetable oil crop in the Coastal Plains area from North Carolina to east Texas. The development of non-shattering high-yielding varieties of sesame is far enough along that the first seed may be offered to farmers within relatively few years.

And if you like sweetened jujubes, you can get a superior American variety of this centuries-old Chinese fruit, thanks to plant explorer Frank N. Meyer who in 1908 brought large-fruited varieties to the Southern Great Plains Field Station at Woodward, Okla. Although the jujube may never be a major crop, it meets the Southwest's needs for a fruit tree that thrives in hot, dry weather and withstands winter freezes without injury.

Science News Letter, November 3, 1951

MEDICINE

Aid for Childless Women Seen in Hormone Chemical

► RESEARCH FOR couples wanting children and for others wanting to postpone parenthood was reported at the New York Academy of Sciences conference in New York on world population problems and birth control.

A hormone chemical from the pituitary gland in the head, which has given the famous anti-arthritis ACTH, will be the answer to the problem of the woman who cannot have children because of ovarian failure, in the opinion of Dr. M. Edward Davis of the Chicago Lying-In Hospital and the University of Chicago.

For the woman blessed with enough children, there is a gel which has provided effective birth control in 98.2% of 704 patients. This was reported by Drs. G. Wilson Hunter, C. B. Darner and J. B. Gillam of Fargo, N. D., and Dr. William B. Stromme of Minneapolis, Minn.

The gel is a "smooth, white, odorless preparation" containing the sperm-killing chemicals, Ricinoleic acid and p-Diisobutylphenoxy-polyethoxyethanol. It is non-irritating, spreads readily and has been found acceptable as well as effective.

"The marked improvement in maternal and infant mortality and morbidity (sickness) statistics in the last 20 years," the North Dakota and Minnesota doctors stated, "is due to the widespread availability of contraceptive information as well as the improved methods of treating these patients."

Their studies were designed to test a method which besides being effective would be easy to use, non-irritating, inexpensive and do away with mechanical devices.

The discovery of ACTH, hormone chemical from the pituitary gland which stimulates the adrenals to produce cortisone, should spur scientists to find a similar hormone that would stimulate growth and rupture of the egg-containing sacs in the ovaries and production of corpus luteum which produces the pregnancy hormone.

ACTH has been tried in the hope of correcting ovarian failure in childless women, but the results have been irregular and not sustained.

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ACOUSTICS

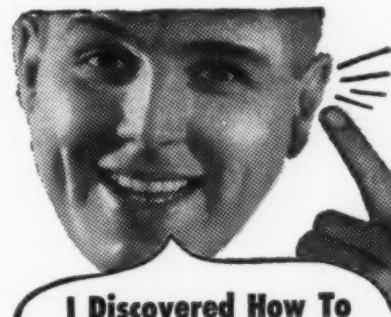
Hearing Aid Automatically Suppresses Loud Noises

► A HEARING aid with a self-regulating noise suppressor to dull sudden, loud sharp noises is the latest help to hard of hearing persons.

It also has a finger-tip control that dims background rumble, designed to help in listening to conversation in a busy restaurant or on the street.

In this last respect, the new aid is "an improvement on the human ear," says Dr. Irving I. Schachtel, president of Sonotone Corporation of New York which manufactures it.

Science News Letter, November 3, 1951



I Discovered How To
HEAR AGAIN
IN 20 SECONDS

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DENTISTRY

36 Mouth Habits Do Damage to Teeth

► MOST PEOPLE grind their teeth while sleeping. Many others clench them, rock them or have one or more of 36 "vicious" mouth habits that can damage gums, other mouth tissues and the teeth themselves. The tooth grinding during sleep chips and loosens teeth and causes considerable erosion and sensitiveness of the gums.

Tooth grinding during sleep can be prevented by wearing an appliance known as the Hawley retainer, Dr. Arthur F. Schopper of Kansas City, Mo., said at the meeting of the American Dental Association in Washington. The appliance was devised to keep the dental arch in place after correction of tooth irregularities. Dr. Schopper finds that it has preserved many teeth for many years and that it can be used by all persons, except those who have an open bite and are unable to bring their upper and lower front teeth together.

For those having an open bite, Dr. Schopper recommends use of bite blocks in the rear teeth to prevent grinding at night.

The 36 "vicious" mouth habits were listed by Dr. John S. McKenzie of Miami, Fla., at the same meeting. Among them are: lip-biting, toothpick-biting, fingernail-biting, biting on straws or matches or hairpins or pencils or pens or the ear part of eye glasses, biting on thread, holding nails or pins between the teeth, thumb-sucking, smoking, chewing of cigars or tobacco, cracking nuts with the teeth, clenching a cigarette holder, opening tops of bottles with the teeth and pressure on the teeth that results from resting the chin on the hand.

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BOTANY

NATURE RAMBLINGS



Falling Leaves

► GENERATIONS OF poets have perpetuated a dismal autumnal picture of "melancholy days, the saddest of the year," with trimmings of wailing winds and "leaves both brown and sear."

But this is not fair. Autumn is a grand season, a time of both fulfillment and preparation. And for the trees that shed their leaves it is no more a time of doom and death than any other season of the year.

The leaves die and drop off, it is true, but the trees themselves stand and survive; they are no more dead in autumn and winter than they are in spring and summer. We humans, egotists that we are, are simply reading our own feelings and reactions into beings whose lives are quite unlike our own.

The trees, as a matter of fact, are very business-like about this letting their leaves go. In their purely automatic, unconscious way they prepare for the coming winter

and the spring that is to follow a great deal better than self-styled *Homo sapiens* manages his own future.

The first thing that happens, as the nights grow longer and chillier, is the draining back into the tree's branches and trunk of practically all the foodstuffs in the leaves. Leaves, as we all know, are the ultimate food factories and during their active life always contain a good deal of sugar, starch and protein. That is why grazing and browsing animals eat them while they are green—nobody ever saw a deer, or even a goat, try to get a living out of fallen leaves.

After the foodstuffs have been drained out of the leaves, the green coloring matter that helps to make them breaks down chemically, and in doing so becomes colorless. It is then that the leaves begin to glow in their autumn glory of yellows and reds and purples.

These colors have been there all the while, the yellows as microscopic solid bits of pigment, the reds and purples as dissolved dyes in the cell-sap. Only during the summer there is so much more of the green pigment in most leaves that it covers up and masks the bright hues.

While the color change is going on, a double layer of cork cells forms right across the base of the petiole, or leaf-stem—the only common case in nature of a bandage being applied before a wound occurs.

After this cork layer is formed, it splits apart, one half going with the leaf, the other covering the scar on the branch and sealing it against the entry of decay-causing germs and spores. Students of plant life call this cork layer the "absciss layer," which in plain English means simply the "cutting-off layer."

And so the leaves drop off.

Science News Letter, November 3, 1951

TECHNOLOGY

Long Distance Dialing

► THE 10,000 telephone dials in homes and offices in Englewood, N. J., will be usable on and after Nov. 10 to dial directly 11,000,000 phones in certain cities across the nation from Boston to San Francisco. The procedure for the telephone subscriber will be as simple as calling another subscriber in Englewood.

The equipment in the Englewood telephone central station necessary for this home-to-home long-distance dialing is completed, the New Jersey Bell Telephone Company has revealed. It is now being used in test calling by Bell engineers from the Englewood building to the 13 urban telephone areas from coast to coast involved in the initial use of long distance dialing.

Each of these areas has a special telephone central with its own particular code number. This code number must be dialed

before the local number wanted is dialed. A telephone subscriber in San Francisco who wants a neighbor might dial GA 1-9950. A telephone user in Englewood who wants the same "neighbor" will dial the ten-digit combination 318-GA 1-9950, the 318 being the code number for the San Francisco area.

The equipment installed in the Englewood central stores up the digits dialed and as soon as the tenth digit is recorded, the call is automatically switched over telephone highways to the called telephone in San Francisco.

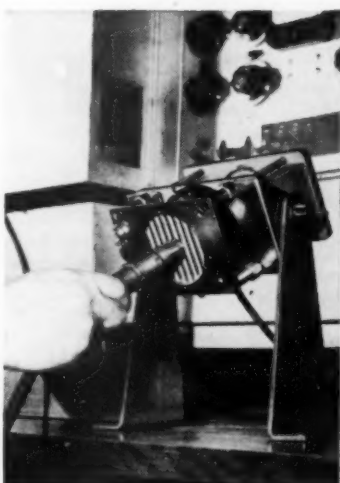
The trial of home-to-home long distance dialing will be limited to Englewood for the present. It will be a one-way system at first. Dial calls into Englewood must wait until proper equipment is installed later in other communities' home central stations.

Science News Letter, November 3, 1951



This Western Electric employee mounts a transmitter in the test fixture which is swung down to face an artificial mouth at 45-degree angle, just as transmitters are held in use. More than a million transmitters are tested each year.

T his mouth speaks to millions



At Bell Laboratories a scientist employs a condenser microphone to check the sound level from another type of artificial mouth, used in transmitter research.

To serve the changing needs of telephone subscribers millions of telephone sets have to be moved each year. Before being put back into service most of them are returned to the Western Electric Company's Distributing Houses where they receive a thorough checkup.

Western Electric engineers needed a rapid method of testing transmitters over a range of frequencies. At Bell Telephone Laboratories, scientists had just the thing—a technique they had devised for fundamental research on transmitters. In co-operation with these scientists, Western Electric engineers developed the practical tester in the illustration.

The transmitter is removed from the handset and put in front of an artificial mouth which emits a tone that swings several times per second over a band of frequencies. A signal lamp tells if the transmitter is good. A test takes 5 seconds.

This new tester illustrates how Bell Laboratories research and Western Electric manufacturing skill team up to maintain your telephone service high in quality yet low in cost.



BELL TELEPHONE LABORATORIES

• EXPLORING AND INVENTING, DEVISING AND PERFECTING, FOR CONTINUED IMPROVEMENTS AND ECONOMIES IN TELEPHONE SERVICE

Books of the Week

TO SERVE YOU: To get books, send us a check or money order to cover retail price. Address Book Dept., SCIENCE NEWS LETTER, 1719 N St., N. W., Washington 6, D. C. Ask for free publication direct from issuing organization.

AMERICAN SOCIAL INSECTS: A Book About Bees, Ants, Wasps, and Termites—Charles D. Michener and Mary H. Michener—*Van Nostrand*, 267 p., illus., \$6.00. An introduction to the behavior of these interesting creatures. Beautifully illustrated with photographs, many in color.

ANNUAL REPORT OF THE BOARD OF REGENTS OF THE SMITHSONIAN INSTITUTION: Showing the Operations, Expenditures, and Condition of the Institution for the Year Ended June 30, 1950—*Govt. Printing Office*, 552 p., illus., \$3.00.

THE AURORAE—L. Hafang—*Wiley*, The International Astrophysics Series, Vol. I, 166 p., illus., \$4.50. Technical data on this striking display.

AUTOMOBILE FACTS AND FIGURES—*Automobile Manufacturers Association*, 31st ed., 80 p., illus., paper, free upon request to publisher, New Center Building, Detroit 2, Michigan. Statistics of the industry.

BIBLIOGRAPHY AND INDEX OF GEOLOGY EXCLUSIVE OF NORTH AMERICA: Vol. 15—Marie Siegrist and Marcia Lakeman—*The Geological Society of America*, 429 p., \$3.00. An alphabetic author list is followed by a subject index. When the title is in a foreign language, an explanatory note in English follows.

A BIO-BIBLIOGRAPHY OF EDWARD JENNER, 1749-1823—W. R. LeFanu—*Lippincott*, 176 p., illus., \$16.00. Notes on the life and varied works of the man who discovered vaccination but was also a naturalist. A limited numbered edition.

THE BIOCHEMISTRY OF FERTILIZATION AND THE GAMETES—R. T. Williams, Ed.—*Cambridge Biochemical Society Symposia* No. 7, 66 p., paper, \$2.25. A symposium discussing the little-known biochemical changes that take place during fertilization.

CALIFORNIA GRASSLANDS AND RANGE FORAGE GRASSES—Arthur W. Sampson, Agnes Chase and Donald W. Hedrick—*California Agricultural Experiment Station, Bulletin* 724,

131 p., illus., paper, free upon request to publisher, The College of Agriculture, University of California, Berkeley, Calif. Information for stockmen, range technicians and students, on the wild grasses and forage grasses of California.

CHEMISTRY FOR THE LABORATORY—Alfred B. Garrett, Joseph F. Haskins, Thor R. Rubin and Frank H. Verhoek—*Ginn*, 356 p., illus., paper, \$3.00. Experiments designed for beginning students without previous training in chemistry.

THE CIVILIZATIONS OF ANCIENT AMERICA: Selected Papers of the XXIXth International Congress of Americanists—Sol Tax, Ed.—*University of Chicago Press*, 328 p., illus., \$7.50. What anthropologists know about the striking civilizations of America which flourished while Europe was in its Dark Ages.

THE DALLES POCKET GOPHER AND ITS INFLUENCE ON FORAGE PRODUCTION OF OREGON MOUNTAIN MEADOWS—A. W. Moore and Elbert H. Reid—*Govt. Printing Office, USDA Circular* No. 884, 36 p., illus., paper, 15 cents. A robust animal which consumes both the tops and the roots of forest crops and ruins additional range with its mounds. Methods of control are recommended.

DESERT AGRICULTURE—N. L. McFarlane and G. L. Winright—*California Agricultural Extension Service, Circular* 176, 56 p., illus., paper, free upon request to publisher, The College of Agriculture, University of California, Berkeley, Calif. How a hot, dry, sandy wasteland has been induced to produce food and forage worth millions of dollars.

EAT, LIVE AND BE MERRY—Carlton Fredericks *Paxton-Slade*, 112 p., illus., paper \$1.00, cloth \$3.00. Bringing together material on nutrition ordinarily found only in journals and research papers.

ECOLOGY OF FORAMINIFERA, NORTHWEST GULF OF MEXICO: Part I. Foraminifera Distribution—Fred B. Phleger. Part II. Foraminifera Species—Fred B. Phleger and Frances L. Parker—*The Geological Society of America, Memoir* 46, 152 p., illus., \$2.75. Analyzed from 550 bottom samples, 65 submarine cores and 27 serial plankton tows from the Northwestern Gulf of Mexico.

EDDINGTON'S PRINCIPLE IN THE PHILOSOPHY OF SCIENCE—Sir Edmund Whittaker—*Cambridge, The Fifth Arthur Stanley Eddington Memorial Lecture*, 35 p., paper, 50 cents. Discussing Eddington's "Fundamental Theory" and the reasons for and against its acceptance.

ELEMENTS OF PLANT PROTECTION—Louis L. Pyenson—*Wiley*, 538 p., illus., \$4.96. A text- and source-book on control of plant diseases and pests.

ESSENTIALS OF BEHAVIOR—Clark L. Hull—*Yale University Press*, 144 p., \$2.75. Containing the author's latest revisions of the basic postulates which constitute the foundation of his theory of behavior; these have been derived from experiment and observation.

GEOLOGIC STRUCTURES IN KANSAS—John Mark Jewett—*State Geological Survey of Kansas, Bulletin* 90, Part 6, 65 p., illus., paper, 10 cents.

HISTORY OF AMERICAN ORNITHOLOGY BEFORE AUDUBON—Elsa Guerdum Allen—*The American Philosophical Society, Transactions New Series*—Vol. 41, Part 3, 1951, 204 p., illus., paper, \$2.00. The story of the observation, description and classification of birds as seen in the lives and studies of the principal workers in the field from Aristotle to Alexander Wilson, Audubon's immediate predecessor and "Father of American Ornithology."

HOME FREEZING OF FRUITS AND VEGETABLES—Bureau of Human Nutrition and Home Economics, Agricultural Research Administration, USDA—*Govt. Printing Office, Home and Garden Bulletin* No. 10, 48 p., illus., paper, 15 cents. Directions for the housewife in filling her own deep freeze. (See p. 281.)

HOMEMADE FRUIT CANDIES—W. V. Cruess and Florence Pen—*California Agricultural Extension Service, Circular* 175, 20 p., paper, illus., free upon request to publisher, The College of Agriculture, University of California, Berkeley, Calif. How to turn California fruits into treats for Christmas and other festive occasions.

LANDSLIDES: A Selected Annotated Bibliography—Jessie M. Tompkin and Severine H. Britt, Eds.—*Highway Research Board, Bibliography* No. 10, 53 p., paper, 90 cents. Includes 291 references with an index of authors and sources.

THE MAGIC CURTAIN: The Story of a Life in Two Fields, Theatre and Invention, by the Founder of the Theatre Guild—Lawrence Langner—*Dutton*, 498 p., illus., \$6.60. The autobiography of a man distinguished in two usually unrelated walks of life.

MARKETING POTENTIAL FOR OILSEED PROTEIN MATERIALS IN INDUSTRIAL USES: A Research and Marketing Act Contract Report—Arthur D. Little, Inc.—*Govt. Printing Office, USDA Technical Bulletin* No. 1043, 120 p., paper, 30 cents. Cottonseed, soybeans, peanuts and flax are four major contributors to farmers' incomes. The dry residue after oil extraction is of increasing value.

OUTLINE OF FUNDAMENTAL PHARMACOLOGY: The Mechanics of the Interaction of Chemicals and Living Things—David Fielding Marsh—*Thomas*, 219 p., \$6.00. Explaining the work and aims of the pharmacologist to scientists and students in other fields.

PATHOLOGICAL FIRESETTING (PYROMANIA)—Nolan D. C. Lewis and Helen Yarnell—*Nervous and Mental Disease Monographs*, No. 82, 437 p., \$10.00. Many fire-setters are subnormal in intelligence, but others are psychotic. This book reports a study by psychiatrists of cases occurring over more than 20 years, conducted in cooperation with The National Board of Fire Underwriters.

PROGRESS IN PHOTOGRAPHY 1940-1950—D. A. Spencer, Ed.—*Focal (Pitman)*—Volume One of International Record, 463 p., illus., \$10.00. Technical information on equipment, processes and techniques of interest to photographers.

RAISING DAIRY CALVES IN CALIFORNIA—S. W. Mead—*California Agricultural Extension Service, Circular* 107, rev. ed., 28 p., illus.,



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paper, free upon request to publisher, The College of Agriculture, University of California, Berkeley, Calif. How to improve the herd for milk production.

A REVIEW OF THE MYSIDACEA OF THE UNITED STATES NATIONAL MUSEUM—Walter M. Tattersall—*Smithsonian*, U. S. National Museum Bulletin 201, 292 p., illus., paper, \$1.00. Includes 120 species of these crustaceans, of which 19 are new.

SMITHSONIAN METEOROLOGICAL TABLES—Robert J. List—*Smithsonian*, 6th rev. ed. 527 p., \$4.00. Revised in both scope and contents.

THE SUNNYSIDE, ROSS BASIN, AND BONITA FAULT SYSTEMS AND THEIR ASSOCIATED ORE DEPOSITS, SAN JUAN COUNTY, COLORADO—W. S. Burbank—*Colorado Scientific Society*, Proceedings, Vol. 15, No. 7, 21 p., illus., paper, \$1.00.

TWELVE COWS—AND WE'RE IN CLOVER: The Story of a Man Who Bought a Farm—George Rehm—*Morrow*, 255 p., \$3.00. A book for city-dwellers who dream of a future life on the farm.

THE UNITED NATIONS AND YOU—United States National Commission for Unesco—*Govt. Printing Office*, Dept. of State Publication 4289, 49 p., illus., paper, 30 cents. A contribution to a better understanding of the United Nations and its relationship to you.

WINTER COVERCROPS—B. A. Madson—*California Agricultural Extension Service*, Circular 174, 24 p., illus., paper, free upon request to publisher, The College of Agriculture, University of California, Berkeley, Calif. The use of plants to keep the soil productive.

Science News Letter, November 3, 1951

INVENTION

High Temperature Strength For Magnesium Alloy

► MANY APPLICATIONS for the metal magnesium are promised with a new alloy which unlike some others has tensile strength at elevated temperatures. The metals used with the magnesium are little known to most people, being what chemists call rare earth metals.

Inventor of this alloy is Thomas E. Leontis, Midland, Mich. He received patent 2,569,477. Rights are assigned to Dow Chemical Company, also of Midland.

Science News Letter, October 13, 1951

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PUBLIC HEALTH

Heat Peril from A-Bomb

► CIVIL DEFENSE planning should take into account the dangers of heat and carbon monoxide poisoning which will come if we are attacked by atom bombs, Dr. Cortez F. Enloe, Jr., of New York, warns in a report in the *JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION* (Oct. 27).

Dr. Enloe was chief of the medical science branch, U. S. Strategic Bombing Survey, which studied the effects of bombing on German health and medical care at the end of World War II. He was recently awarded the Legion of Merit for his work in this capacity.

The effects of high explosive and fire-bomb raids on individuals in German cities was not much different from the effects of the atom bombs on individuals in Hiroshima and Nagasaki, excluding the radiation effects. The radiation effects accounted for about one-fifth of the casualties in the Japanese cities.

In a high explosive raid, the type carried out on European cities and the type to which this country is apparently immune, mechanical injuries would outnumber deaths. But in an atomic bomb attack, Dr. Enloe states, "it is expected that the effects of heat and carbon monoxide would cause more deaths than injuries."

By heat deaths is meant death from the high temperatures and not from burns.

Heat stroke, he points out, caused the death of many Germans in rooms from which they could have escaped.

Temperatures in Hamburg, during one of the fire raids, according to police estimates, went as high as 1,472 degrees Fahrenheit in the burning city blocks. The temperature of boiling water is 212 degrees Fahrenheit, that of the normal human body 98.6 degrees.

In this same city, it is estimated that 70% of all casualties not resulting from mechanical injury or burns were caused by carbon monoxide gas, Dr. Enloe states.

"Carbon monoxide casualties may always be expected in flaming buildings where exits have been blocked by rubble, indicating the imperative need for adequate exits," he warns. "One cannot glibly endorse the general attitude that the basement of every dwelling affords relative safety. It may afford safety from blast, but if the building catches fire, and, as we have said, fire is the main cause of atomic bomb damage, the cellar becomes but a tomb."

Some persons may be expected to "drown in dust" because of dust blockage of their noses and throats in the raid.

Drowning in water is a danger in shelters and basements if water mains are broken and buildings collapse.

Establishment of psychiatric first-aid stations, Dr. Enloe declares, is sound in theory "but experience has shown that it is a waste of time." Contrary to expectation, air attacks on the civilian population do not increase the amount of psychiatric disorders.

Science News Letter, November 3, 1951

OPTICS

World-Wide Standards Set For Signal Light Colors

► IF YOU have difficulty because you confuse two of the colors of signal lights, your troubles will be lightened in the future.

World-wide standards have now been set for signal lights of all kinds—aircraft, railroad, automobile and ocean liner—Dr. Francis C. Breckenridge of the National Bureau of Standards told the Optical Society of America meeting in Chicago. Specifications for red, yellow, green, blue and white signal lights have been set.

But the changes that will be made because of this standardization, he said, will be so gradual that the user "will hardly be aware of any change in the signal colors."

The standards for all signal lights were worked out by a special committee of the International Commission on Illumination. Those for aviation signals have already been adopted by ICAO, the International Civil Aviation Organization. This country will find "little difficulty" in adapting our lights to agree with the new definitions, Dr. Breckenridge predicted.

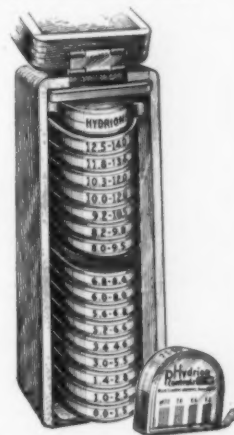
Science News Letter, November 3, 1951

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☼ **FISHING LURE**, used with an off side vane in trawling, will keep the line and bait well to one side of the path of the moving boat. With its adjustable rudder set, it will hold line and bait as much as 27 feet off side, permitting the boat to travel in deep water while trawling the shore.

Science News Letter, November 3, 1951

☼ **CARPET WITH** foam rubber backing is made in a unit without adhesives by applying the rubber to the fabric in the form of a thick cream that solidifies to become an integral part of the floor-covering. The rubber backing can be applied to a thickness of five eighths of an inch.

Science News Letter, November 3, 1951

☼ **REFLECTOR FOR** the coat lapel, belt or back of the coat, provides safety for the pedestrian at night because it picks up the rays from an automobile headlight and shines like a caution signal to oncoming motorists for hundreds of yards. It is made of a plastic-covered reflective sheeting.

Science News Letter, November 3, 1951

☼ **BRACKETS TO** hold such kitchen accessories as knife holders, paper towels, match boxes and memo pads, are made of styron plastic and require no nails or screws to attach them to the wall. They have an adhesive pad back which is softened with a solvent accompanying a kit of the brackets.

Science News Letter, November 3, 1951

☼ **OPEN-HANDLE FLATIRON**, designed to ease the work of the housewife, has the front of the handle open instead of closed as in conventional irons. Such an iron is shown in the photograph. This allows the



hand and wrist to remain in a natural relaxed position during all ironing operations, and fingers are free to operate its seven-temperatures control.

Science News Letter, November 3, 1951

☼ **WATER PURIFIER**, to attach to the side of the tap over a kitchen sink, is a stainless steel unit six inches in diameter that removes bacteria, organisms, dirt and odors from the water passing through. It contains a filter to which germ-killing chemicals have been added.

Science News Letter, November 3, 1951

☼ **HUB CAP** for the automobile, recently patented, has within it a rectangular frame to hold an identification card with name of owner, engine number and other information. The frame is welded to the inside of the metal cap, and it holds the card protected from the weather and unauthorized viewing.

Science News Letter, November 3, 1951

☼ **AIR-PURIFIER**, for home, office and hospital use, employs both ultraviolet rays and ozone in the purification process. It destroys odors by means of electronically produced ultraviolet rays. The purifying ozone, generated within it, reverts back into oxygen when it has done its work.

Science News Letter, November 3, 1951

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Do You Know?

Strawberry plants set out in the fall seem to produce more fruit than those set in the spring.

After July 1, 1952, nautical miles and knots will be standard distance and speed measurements for aircraft.

Cookies in the cookie jar will dry out very slowly if a piece of cut apple is put in the jar.

Storing the corn plant in silos saves more of its food value than any other method of harvesting and storage.